Amendments in the claims

1. (currently amended) A wafer testing device comprising:

an at least five motion axis computer numeric controlled wafer handling system having:

i) at least one linear precision movement axis;

ii) one handling rotation axis;

iii) one vertical gross positioning linear axis;

iv) one vertical dual position axis;

wherein said linear precision movement axis is provided by a linear precision stage combined with a chuck for receiving and positioning said wafer for optical wafer testing, said linear precision stage having a travel of about the diameter of said wafer;

wherein said handling rotation axis is provided by a robotic single axis system combined with said linear precision stage in a fixed position relative to a center axis of said chuck, said robotic single axis system including an effector having a shaft substantially concentric with said rotation axis and having a distal carrying face, said shaft being immediately adjacent said chuck and rotating said effector between a chuck loading orientation and an elevator alignment orientation, wherein said carrying face is substantially concentric with said center axis when said effector is in said chuck loading orientation;

wherein said gross positioning linear axis is provided by an elevator configured for vertically moving a substantially vertically arranged cassette and prealigner such that while said

effector is in said elevator alignment orientation said effector may be alternatingly moved by said linear precision stage in between a number of wafer stacking levels of said cassette to a ~~the~~ point where the carrying face is interfering with a wafer stacking axis and into said prealigner with said carrying face interfering with a prealigner operating axis;

wherein said dual position axis is provided by pinlifters having a top position in which top faces of said pinlifters are above said carrying face and a bottom position in which said top faces are below a wafer holding face of said chuck such that said wafer may be moved between said wafer holding face and said top position and such that said wafer may be loaded and unloaded from said carrying face while said effector is in said chuck loading position;

wherein said carrying face is placed on a tangential distal portion of said effector such that said carrying face is rotated into and out of said chuck loading orientation in which said carrying face interferes with a chuck center axis without colliding of the effector with said pin lifters being in said top position; and

wherein said robotic single axis system has exactly one rotatable mechanical connection~~.~~;

further comprising:

b) a second linear precision stage substantially perpendicular to said linear precision stage; and

c) a virtual loading axis having a loading travel that is substantially the square root of the sum of each of the stage's travel squared.

2. (previously presented) The wafer testing device of claim 1, wherein

said wafer testing device is configured for testing a wafer with a diameter of about 300mm; and

said wafer testing device has a head clearance of about 1.25 inches plus about 0.75mm.

3. (canceled)

4. (currently amended) A wafer handling system comprising:

a) at least one horizontal linear precision movement axis;

b) one handling rotation axis;

c) one vertical gross positioning linear axis;

d) one vertical dual position axis;

wherein said linear precision movement axis is provided by a linear precision stage combined with a chuck for receiving and positioning said wafer for optical wafer testing, said linear precision stage having a travel of about the diameter of said wafer;

wherein said handling rotation axis is provided by a robotic single axis system combined with said linear precision stage in a fixed position relative to a center axis of said chuck, said robotic single axis system including an effector having a shaft substantially concentric with said rotation axis and having a distal carrying face, said shaft being immediately

adjacent said chuck and rotating said effector between a chuck loading orientation and an elevator alignment orientation, wherein said carrying face is substantially concentric with said center axis when said effector is in said chuck loading orientation;

wherein said gross positioning linear axis is provided by an elevator configured for vertically moving a substantially vertically arranged cassette and prealigner such that while said effector is in said elevator alignment orientation said effector may be alternatingly moved by said linear precision stage in between a number of wafer stacking levels of said cassette to the point where the carrying face is interfering with a wafer stacking axis and into said prealigner with said carrying face interfering with a prealigner operating axis;

wherein said dual position axis is provided by pinlifters having a top position in which top faces of said pinlifters are above said carrying face and a bottom position in which said top faces are below a wafer holding face of said chuck such that said wafer may be moved between said wafer holding face and said top position and such that said wafer may be loaded and unloaded from said carrying face while said effector is in said chuck loading position;

wherein said carrying face is placed on a tangential distal portion of said effector such that said carrying face is rotated into and out of said chuck loading orientation in which said carrying face interferes with a chuck center axis without colliding of the effector with said pin lifters being in said top position; and

wherein said robotic single axis system has exactly one rotatable mechanical connection~~.~~;

further comprising:

e) a second linear precision stage substantially perpendicular to said linear precision stage; and

f) a virtual loading axis having a loading travel that is substantially the square root of the sum of each of the stage's travel squared.

5. (canceled)

6. (currently amended) A robotic single axis system comprising:

a) an assembly plate having a central cutout arc for attaching said robotic single axis system to a stage system substantially concentric to a chuck of said stage system;

b) a controlled motor attached to said assembly plate and disposed within lateral boundaries of said assembly plate;

c) an effector having:

i) a rotatable mounted shaft rotatably attached to said assembly plate and disposed within said lateral boundaries of said assembly plate;

ii) a radial arm portion;

iii) a tangential arm portion at a distal end of said radial arm portion;

iv) a vacuum actuated carrying face at said tangential arm, said carrying face being configured for fixedly holding a

wafer while said wafer is snugly contacting said carrying face and while a vacuum is applied;

v) an internal vacuum line between said carrying face and a non rotating hub adjacent said shaft for applying said vacuum to said carrying face via said hub;

wherein said radial arm portion and said tangential arm portion are such that said effector fits within said lateral boundaries of said assembly plate while said effector is in a parking position;

d) a reduction gear coupling said motor and said shaft while reducing a rotational speed of said motor into an angular speed of said effector, said reduction gear being attached to said assembly plate and disposed within said lateral boundaries of said assembly plate;

e) a rotation sensor for recognizing at least one of an angular orientation and a rotational speed of at least one of said effector and said motor, said rotation sensor being attached to said assembly plate and disposed within lateral boundaries of said assembly plate;

f) a vacuum actuation means for actuating a vacuum at said hub, said vacuum actuation means being disposed within lateral boundaries of said assembly plate; and

wherein said robotic single axis system has exactly one rotatable mechanical connection~~.~~;

further comprising:

e) a second linear precision stage substantially perpendicular to said linear precision stage; and

f) a virtual loading axis having a loading travel that is substantially the square root of the sum of each of the stage's travel squared.

7. (previously presented) The robotic single axis system of claim 6, wherein said lateral boundaries fit within a concentric envelope of a chuck for carrying a wafer having a diameter of about 300mm diameter, said concentric envelope having a diameter no larger than about 21 inches with said effector being in parking position.

8. (canceled)